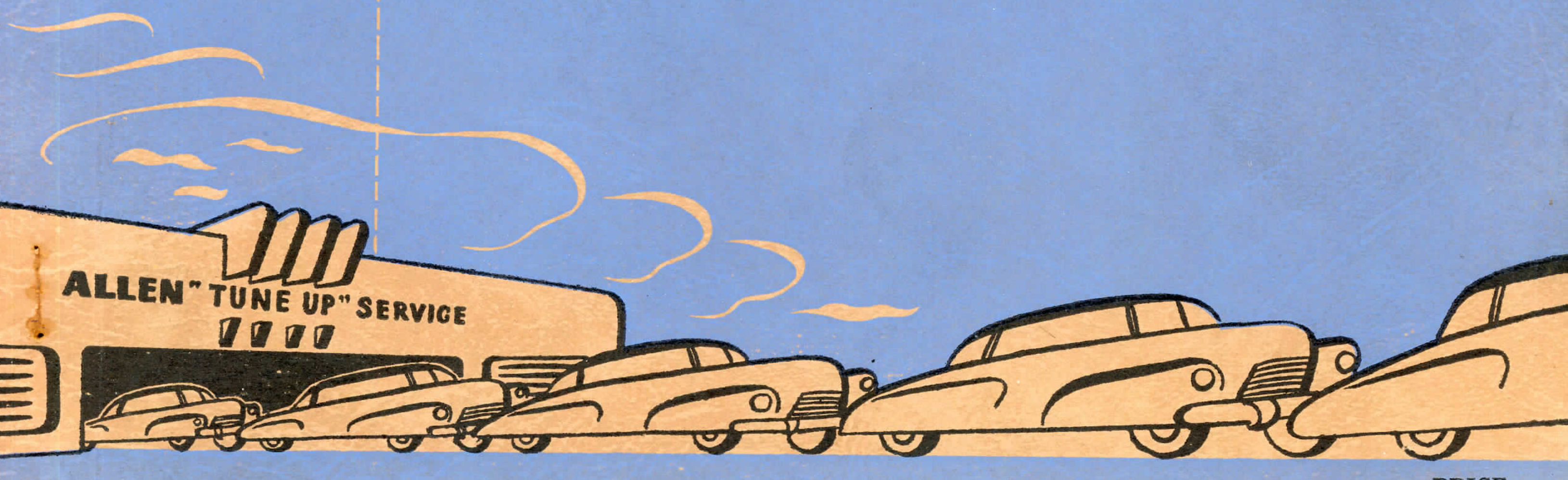
OPERATING INSTRUCTIONS
for the

ALLEN

MODEL E-301
CONDENSER TESTER

ALLEN EQUIPMENT CORRECTLY OPERATED

MEANS MORE SATISFIED CUSTOMERS



ALLEN ELECTRIC and EQUIPMENT COMPANY • KALAMAZOO, MICHIGAN

PRICE
25 CENTS

OPERATING INSTRUCTIONS
FOR THE
ALLEN E-301
CONDENSER TESTER

USE THE FOLLOWING ITEMS:

1 DOUBLE TEST LEAD WITH RED AND BLACK INSULATORS - ALUMINUM COLORED PLUG.
1 BATTERY LEAD WITH YFLLOW AND BLACK CLIPS - MOLDED SOCKET.

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PRICE 25¢

ALLEN ELECTRIC AND EQUIPMENT COMPANY
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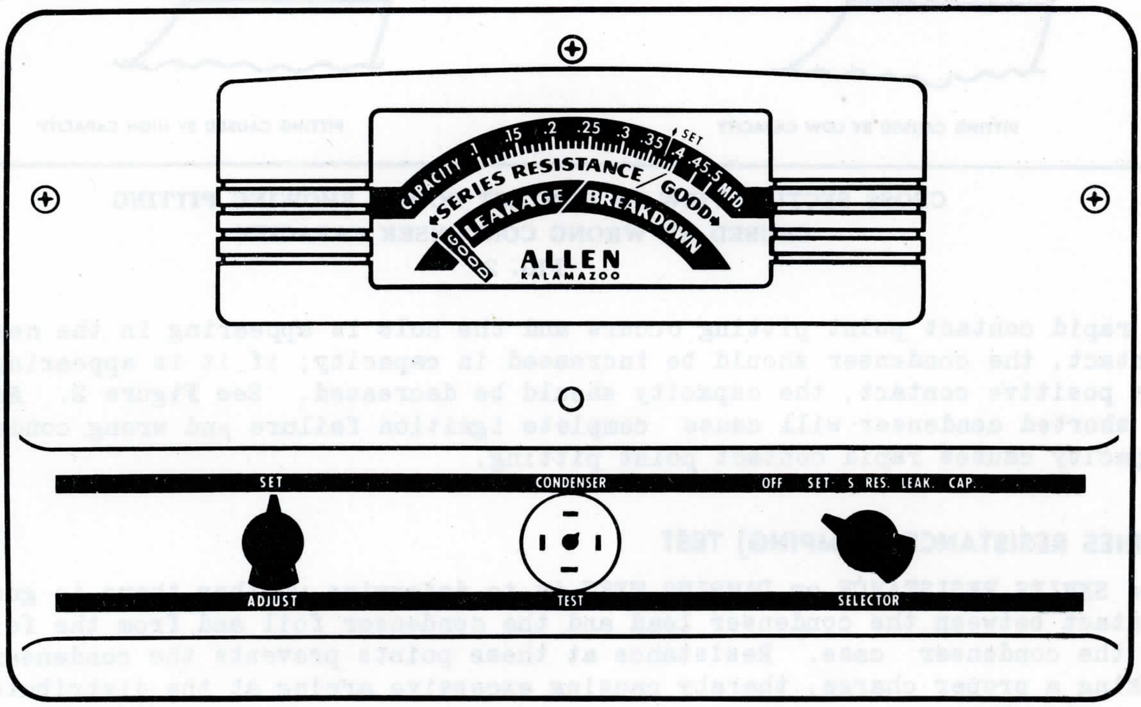
THE MODEL E-301 CONDENSER TESTER

PURPOSE OF THE TESTER

The Allen Model E-301 CONDENSER TESTER is a precision instrument which gives a complete analysis of the condition of magneto or battery ignition condensers. The condenser is tested for BREAKDOWN, LEAKAGE, CAPACITY, and SERIES RESISTANCE (DAMPING). Long, calibrated leads are provided, for testing the condenser on or off the vehicle. The unit operates from either the vehicle 6 volt storage battery or from a separate storage battery. No A.C. supply is required.



CONDENSER TESTER FRONT PANEL

FIG. 1

SELECTOR SWITCH

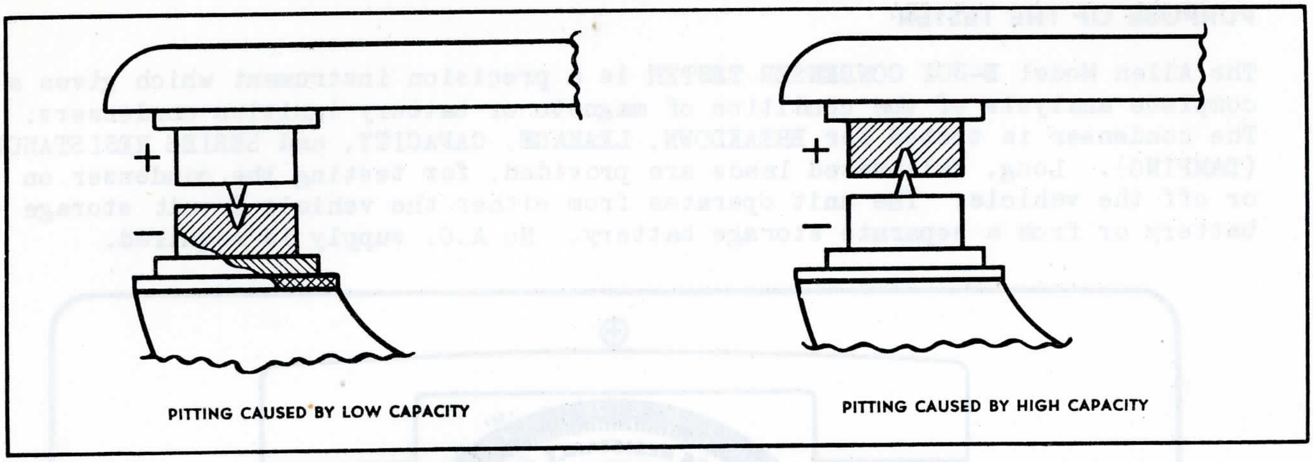
The SELECTOR switch is used for selecting the various tests applied to the condenser. In the OFF position the instrument is turned off and is inoperative. The meter lamps remain lighted in all positions of the SELECTOR switch until the instrument is disconnected from the battery. The SET position is used for calibrating the instrument to compensate for variations in circuit components and battery voltage. When the switch is set to the CAP. position, the meter shows the condenser capacity in MFD. (microfarads). When set to the S. RES. position, the meter shows the damping effect or series resistance of the condenser and when in the LEAK position, the meter shows the breakdown and leakage condition of the condenser.

EXPLANATION OF TESTS

CAPACITY TEST

This test shows the condenser capacity. The Tester is calibrated for magneto and battery ignition condenser capacity values from 0 to .5 mfd. This test makes it possible to select the proper condenser capacity for any particular type of service; high capacity for slow engine speeds, and low capacity for high engine speeds.

EXPLANATION OF TESTS—Continued



PITTING CAUSED BY LOW CAPACITY

PITTING CAUSED BY HIGH CAPACITY

CROSS SECTION VIEW OF CONTACT POINTS SHOWING PITTING CAUSED BY WRONG CONDENSER CAPACITY

FIG. 2

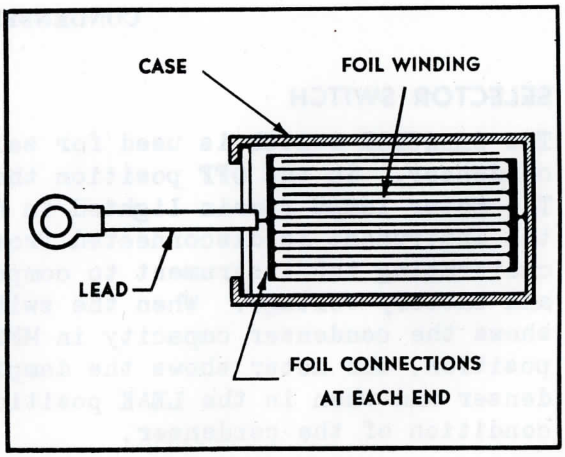
If rapid contact point pitting occurs and the hole is appearing in the negative contact, the condenser should be increased in capacity; if it is appearing in the positive contact, the capacity should be decreased, See Figure 2. An open or shorted condenser will cause complete ignition failure and wrong condenser capacity causes rapid contact point pitting.

SERIES RESISTANCE (DAMPING) TEST

The SERIES RESISTANCE or DAMPING TEST is to determine whether there is good contact between the condenser lead and the condenser foil and from the foil to the condenser case. Resistance at these points prevents the condenser from taking a proper charge, thereby causing excessive arcing at the distributor contact points.

Figure 3 shows the internal construction of the condenser to illustrate the connections to the foil windings. Poor contact at the foil, case or lead results in faulty condenser performance.

The Allen Model E-301 Condenser Tester employs a high frequency oscillator circuit to accurately detect excessive resistance in the condenser. Premature point failure, hard starting and missing at high speeds are caused by series resistance.



INTERNAL CONSTRUCTION OF CONDENSER

FIG. 3

BREAKDOWN TEST

The BREAKDOWN test determines whether or not the condenser will flash over, causing the engine to miss under high compression when the voltage across the condenser is at its highest. The Condenser Tester checks the condenser for breakdown of the internal insulation at approximately twice the voltage encountered in service. It will not ruin a good condenser, but will definitely detect a condenser with faulty insulation.

EXPLANATION OF TESTS —Continued

LEAKAGE TEST

The LEAKAGE test determines whether low resistance exists between the layers of foil in the condenser which would cause leakage of the condenser charge between the time that the distributor contact points open and close. The Condenser Tester is properly calibrated to detect abnormal resistance which would allow harmful leakage across the condenser insulation. Low internal leakage will cause the condenser to breakdown and short out causing complete ignition failure.

TESTING THE CONDENSER

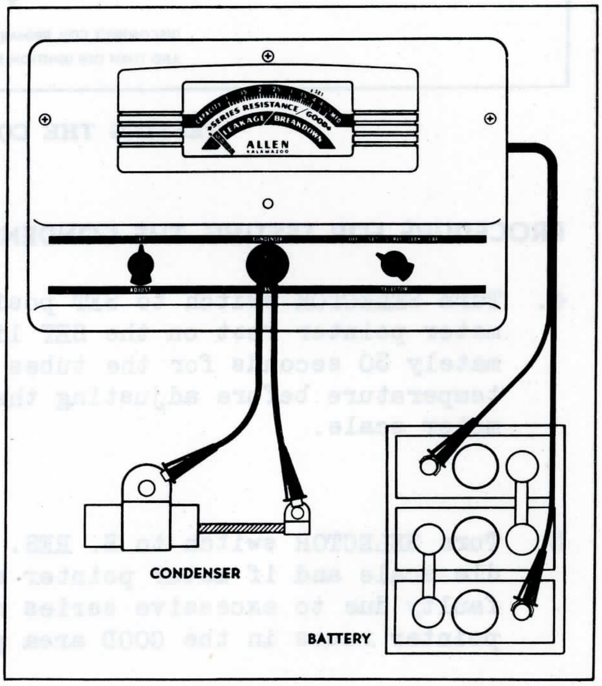
PLACING TESTER IN OPERATION

1. Turn SELECTOR switch to OFF position.

2. Connect battery leads from Tester to a fully charged 6 volt storage battery. No polarity is required. Connect one lead to positive side of battery and the other lead to the negative side of the battery. Fig 4.

3. Plug the DOUBLE TEST LEAD into the CONDENSER test socket and connect one test clip to condenser lead or terminal and the other test clip to condenser case. Figure 4.

   When testing a condenser on the vehicle, the contact points must be spaced open by a fiber block or other insulating material and the ignition switch turned OFF. Connect one test clip to the distributor low tension terminal and the other test clip to a clean ground on the distributor housing. See Figure 5.



CONNECTIONS TO TESTER FOR CHECKING THE CONDENSER

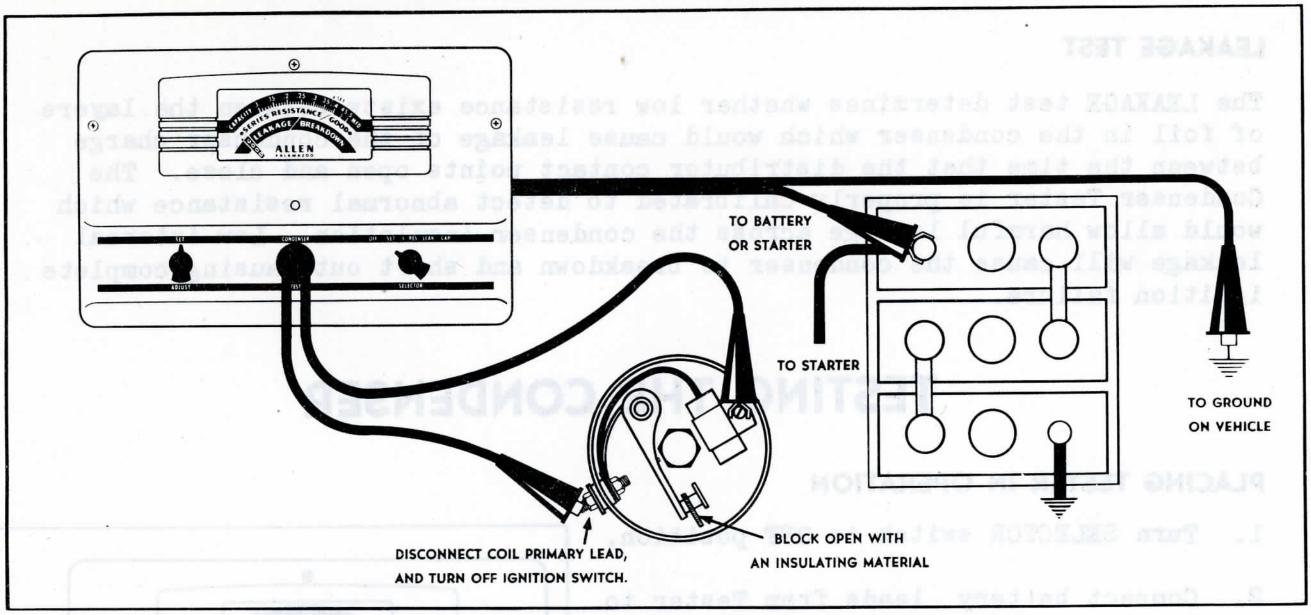
FIG. 4

On vehicles equipped with Electrolock Cable from distributor, it will be necessary to disconnect condenser from ground and block open the distributor contact points. Connect one test clip to condenser case and the other test clip to the contact arm. Do not allow condenser case to make contact to ground.

When testing a condenser mounted in a magneto, disconnect the coil to breaker contact lead, block open the breaker contacts and attach one test clip from the Tester to the breaker contact from which the coil lead is disconnected and the other test clip to ground on the magneto.

"TESTING THE CONDENSER" CONTINUED ON FOLLOWING PAGE

TESTING THE CONDENSER—Continued



TESTING THE CONDENSER ON THE VEHICLE
FIG. 5

PROCEDURE FOR TESTING THE CONDENSER

4. Turn SELECTOR switch to SET position, and turn ADJUST SET control until meter pointer rest on the SET line on the top meter scale. Allow approximately 30 seconds for the tubes in the Tester to warm up to operating temperature before adjusting the meter pointer to the SET line on the meter scale.

5. Turn SELECTOR switch to S. RES. position. Note meter reading on the middle scale and if meter pointer reads in the red area the condenser is faulty due to excessive series resistance and should be replaced. If meter pointer rests in the GOOD area proceed with the following test.

6. Turn SELECTOR switch to LEAK position. Note meter reading on the bottom scale and if meter pointer reads in the LEAKAGE or BREAKDOWN area the condenser is faulty due to excessive leakage or breakdown of the insulation and should be replaced. If meter pointer rests in the GOOD area, proceed with the following test.

7. Turn SELECTOR switch to CAP (capacity) position. Note meter reading on top scale. This reading should conform to the manufacturer's specifications pertaining to condenser capacity. Most battery ignition condensers have a capacity between .2 and .3 microfarads. No reading on the meter scale indicates an open connection and if this condition exists, the condenser should be replaced.

8. Turn SELECTOR switch to OFF position to discharge condenser before disconnecting the leads.

TESTING THE CONDENSER—Continued

When testing a condenser ON the vehicle, if the condenser test meter indicates a defect, remove the condenser and repeat the test. If the breaker arm bushing, or primary terminal bushing, are defective, or if the breaker arm or spring is grounded, a defect in the condenser would be indicated, when actually the condenser is not at fault.

When replacing the condenser, the pigtail must always be connected so that it does not contact any grounded part of the distributor, otherwise, the engine will fail to start.

WRITING THE FACTORY

Should it be necessary to communicate with the factory, relative to your Tester, ALWAYS furnish its name, model number and serial number so that prompt and efficient attention can be rendered.

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CARE AND MAINTENANCE OF ELECTRICAL EQUIPMENT

1. DO NOT allow petroleum products, acids or alkalies, to come in contact with painted surfaces or plastic components.

2. Use a clean soft cloth for a DAILY dust cloth.

3. PLASTIC PANELS, LEADS AND SOCKS should be cleaned with MILD SOAP AND WATER.

4. SMALL SCRATCHES can sometimes be removed from plastic with rouge.

5. CORRODED TERMINALS can be cleaned with a solution of baking soda and water.

6. HEAT, generated in leads and clips, which becomes more than warm to the touch is a result of a poor connection and will result in an extra load being placed on the unit.

7. LARGE ranges have been placed on meters for heavy loads, SMALL ranges for finer reading. Always select the range large enough for the job, or damage will result.

8. IN MAKING ELECTRICAL CONNECTIONS, always watch the meter when you cause the current to flow; don't overload the meter. Use the proper shunt.

9. MOISTURE is second only to grease-and-dirt in shortening the life of electrical equipment. One of the less obvious ways in which moisture can damage equipment is to store in a non-heated area. Moisture can cause meters to stick, transformers to short, insulation and condensers to deteriorate.

10. METERS REQUIRING A POWER SUPPLY. A.C. or D.C. current may be required. It may be of a high or low voltage. Exercise caution in connection units to proper voltage source.

11. POWER TIMING LAMP. Its life will be greatly lengthened if disconnected when not in use.

12. POLARITY. Care should be exercised to see that units are not connected in reverse polarity.

13. In most cases, when units have been subjected to materials used in fire extinguishers, they may be considered beyond repair in making insurance adjustment.

14. SIX VOLT PLUG-IN RECEPTACLE UNITS will work better after a small amount of powdered graphite has been applied.

15. FANS. Units having a fan for cooling purposes cannot function well if covered, as air flow is restricted.

16. METERS exposed to the sun's rays for long periods of time will fade.

17. GROWLERS should not be turned "ON" unless first an armature has been placed into position to test.

18. UNITS USING FLASHLIGHT BATTERIES should be turned to the "OFF" position when not in use. When the batteries become discharged they should be removed at once, or damage will result.

19. IN EACH INSTANCE, REFER TO THE INSTRUCTION MANUAL BEFORE ATTEMPTING TO OPERATE. MINOR CHANGES HAVE SOMETIMES BEEN MADE, AND NEW MODELS MAY OPERATE DIFFERENTLY THAN PREVIOUS ONES.

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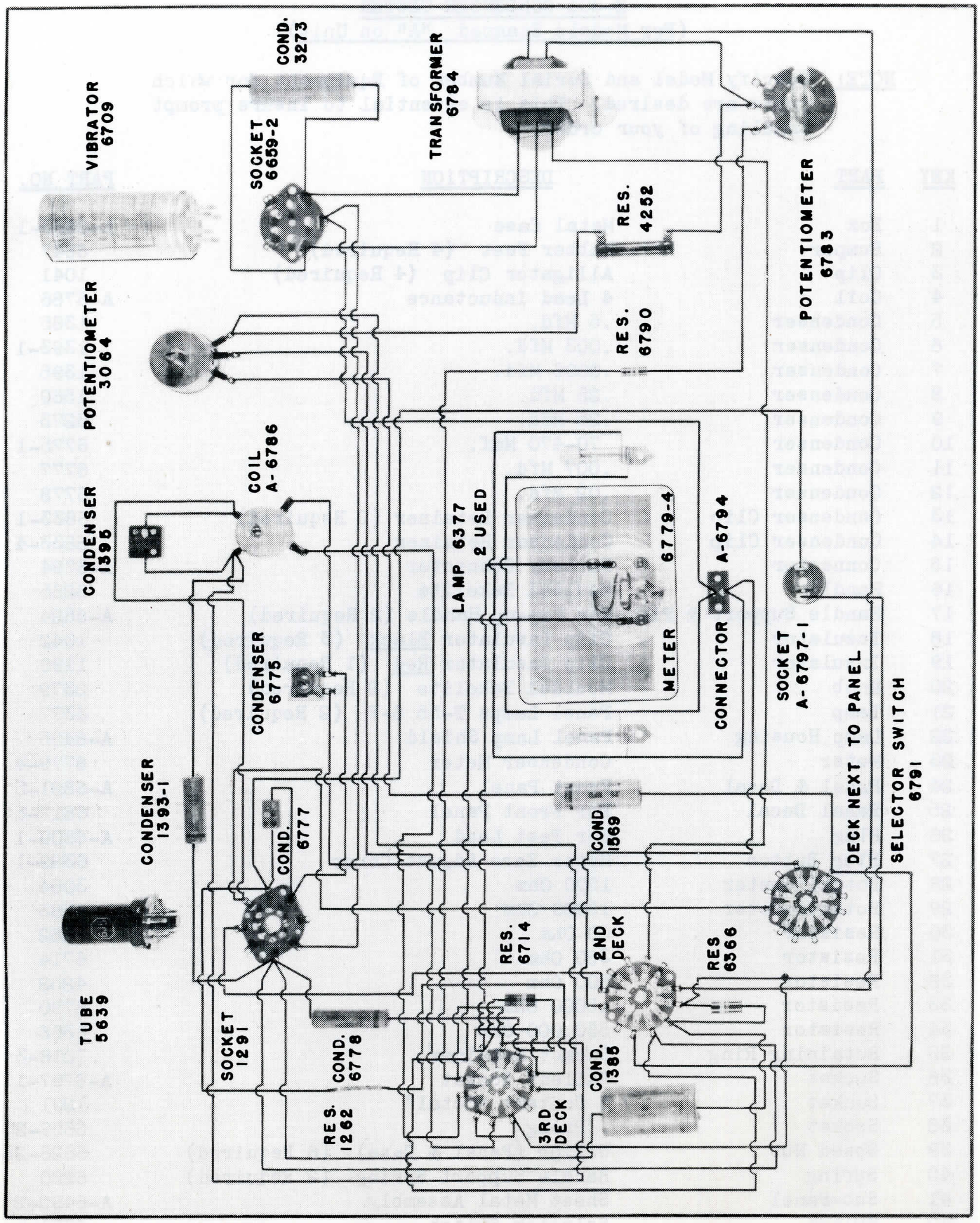
E-301 CONDENSER TESTER SCHEMATIC CIRCUIT DIAGRAM
FOR MODELS STAMPED SERIES "A"



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REPLACEMENT PARTS LIST

E-301 CONDENSER TESTER
(For Models Stamped "A" on Unit)

NOTE: Specify Model and Serial Number of Equipment for which parts are desired. This is essential to insure prompt handling of your order.

KEY	PART	DESCRIPTION	PART NO.
1	Box	Metal Case	A-6463-1
2	Bumper	Rubber Feet (4 Required)	6847
3	Clip	Alligator Clip (4 Required)	1041
4	Coil	4 Lead Inductance	A-6786
5	Condenser	.5 Mfd.	1385
6	Condenser	.003 Mfd.	1393-1
7	Condenser	.0006 Mfd.	1395
8	Condenser	.25 Mfd.	1569
9	Condenser	.25 Mfd.	3273
10	Condenser	70-470 Mmf.	6775-1
11	Condenser	.007 Mfd.	6777
12	Condenser	.02 Mfd.	6778
13	Condenser Clip	Condenser Retainer (2 Required)	6833-1
14	Condenser Clip	Condenser Retainer	6833-4
15	Connector	Battery Connector	A-6794
16	Handle	Moulded Bakelite	6265
17	Handle Support & Pin	For Pop-up Handle (2 Required)	A-6824
18	Insulator	Clip Insulator Black (3 Required)	1042
19	Insulator	Clip Insulator Red (1 Required)	1190
20	Knob	Moulded Bakelite (2 Required)	2379
21	Lamp	Panel Lamps T-55 6-V (2 Required)	6377
22	Lamp Housing	Panel Lamp Shield	A-6485
23	Meter	Condenser Meter	6779-4
24	Panel & Decal	Front Panel	A-6821-5
25	Panel Decal	For Front Panel	6817-5
26	Plug	For Test Lead	A-6809-1
27	Plug Button	Meter Zero Adjust Cover	6389-1
28	Potentiometer	1500 Ohm	3064
29	Potentiometer	15000 Ohm	6783
30	Resistor	60 Ohm	1262
31	Resistor	360 Ohm	6714
32	Resistor	500 Ohm	4252
33	Resistor	15000 Ohm	6790
34	Resistor	560,000 Ohm	6366
35	Retaining Ring	Socket Retainer	7018-3
36	Socket	"Allen" Socket	A-6797-1
37	Socket	8 Contact "Octal"	1291
38	Socket	5 Prong	6659-2
39	Speed Nut	U Type (Panel & Case) (6 Required)	6628-25
40	Spring	Handle Support Spring (2 Required)	6280
41	Sub-Panel	Sheet Metal Assembly	A-6490-2
42	Switch	Selector Switch	6791

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REPLACEMENT PARTS LIST FOR E-301 CONDENSER TESTER - (CONTINUED)

(FOR MODELS STAMPED SERIES "A")

KEY	PART	DESCRIPTION	PART NO.
43	Switch Insulation	.015" Paper	6782
44	Terminal Strip	3 Terminal for Mounting Resistor	2299
45	Transformer	Vibrator Transformer	6784
46	Tube	6J5GT	5639
47	Vibrator	5 Prong	6709
48	Washer	Fibre 1/32" x 1/2"	6820
49	Window Cover	Meter Window Cover	6270
50	Wiring Diagram		A-6813-1
51	Wiring Diagram	Schematic	A-6814-1
	E-301 LEADS		
52	Battery Lead	(Tester to Battery)	A-6810
53	Test Lead	(Aluminum Plug)	A-7067

File in Allen Service Handbook

E-301
7-15-48

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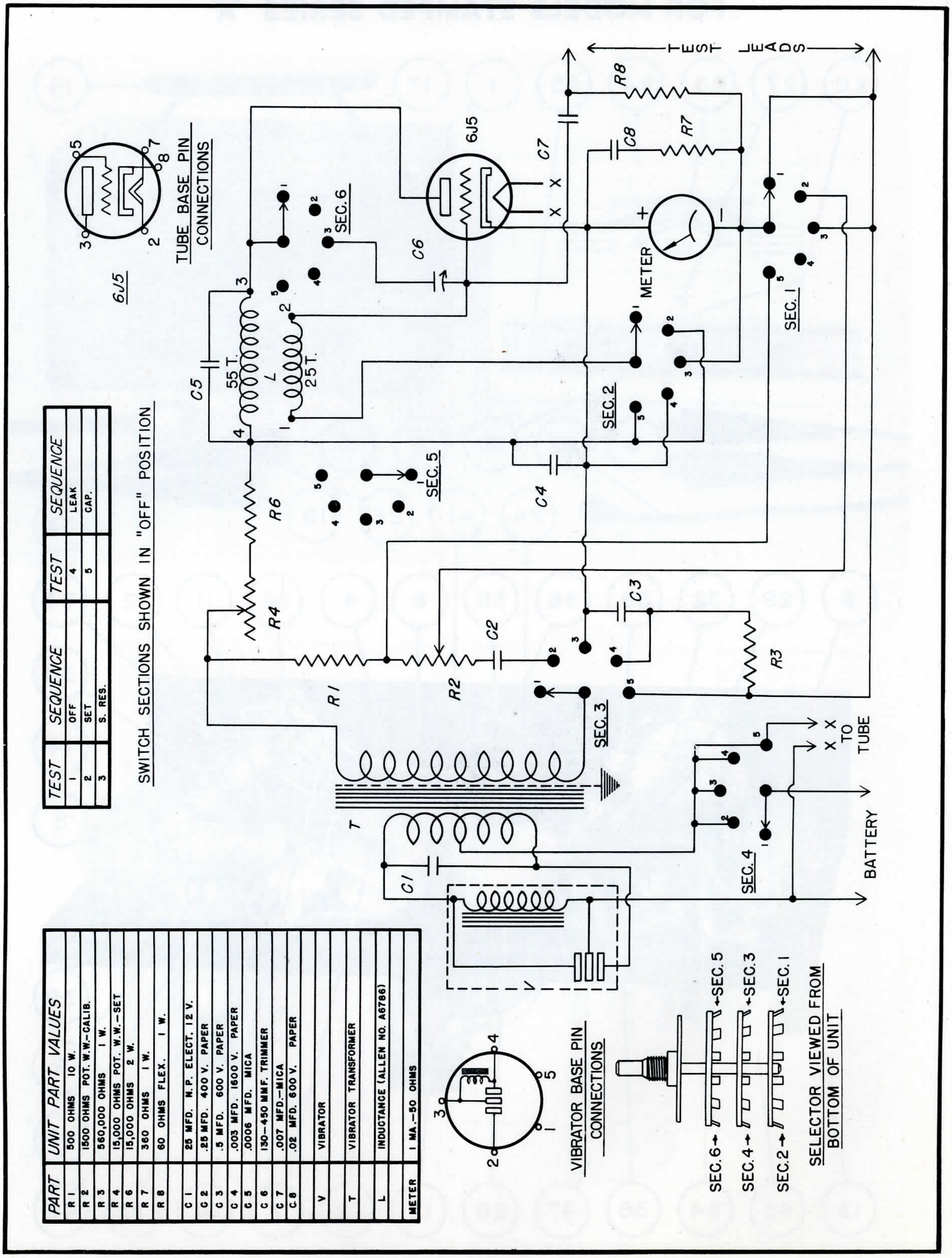
E-301 CONDENSER TESTER SCHEMATIC WIRING DIAGRAM

FOR MODELS STAMPED SERIES "A"



TEST	SEQUENCE	TEST	SEQUENCE
1	OFF	4	LEAK
2	SET	5	CAP.
3	S. RES.		

SWITCH SECTIONS SHOWN IN "OFF" POSITION

PART	UNIT PART VALUES
R 1	500 OHMS 10 W.
R 2	1500 OHMS POT. W.W.-CALIB.
R 3	560,000 OHMS 1 W.
R 4	15,000 OHMS POT. W.W.-SET
R 6	15,000 OHMS 2 W.
R 7	360 OHMS 1 W.
R 8	60 OHMS FLEX. 1 W.
C 1	25 MFD. N.P. ELECT. 12 V.
C 2	.25 MFD. 400 V. PAPER
C 3	.5 MFD. 600 V. PAPER
C 4	.003 MFD. 1600 V. PAPER
C 5	.0006 MFD. MICA
C 6	130—450 MMF. TRIMMER
C 7	.007 MFD.—MICA
C 8	.02 MFD. 600 V. PAPER
V	VIBRATOR
T	VIBRATOR TRANSFORMER
L	INDUCTANCE (ALLEN NO. A6786)
METER	1 MA.—50 OHMS

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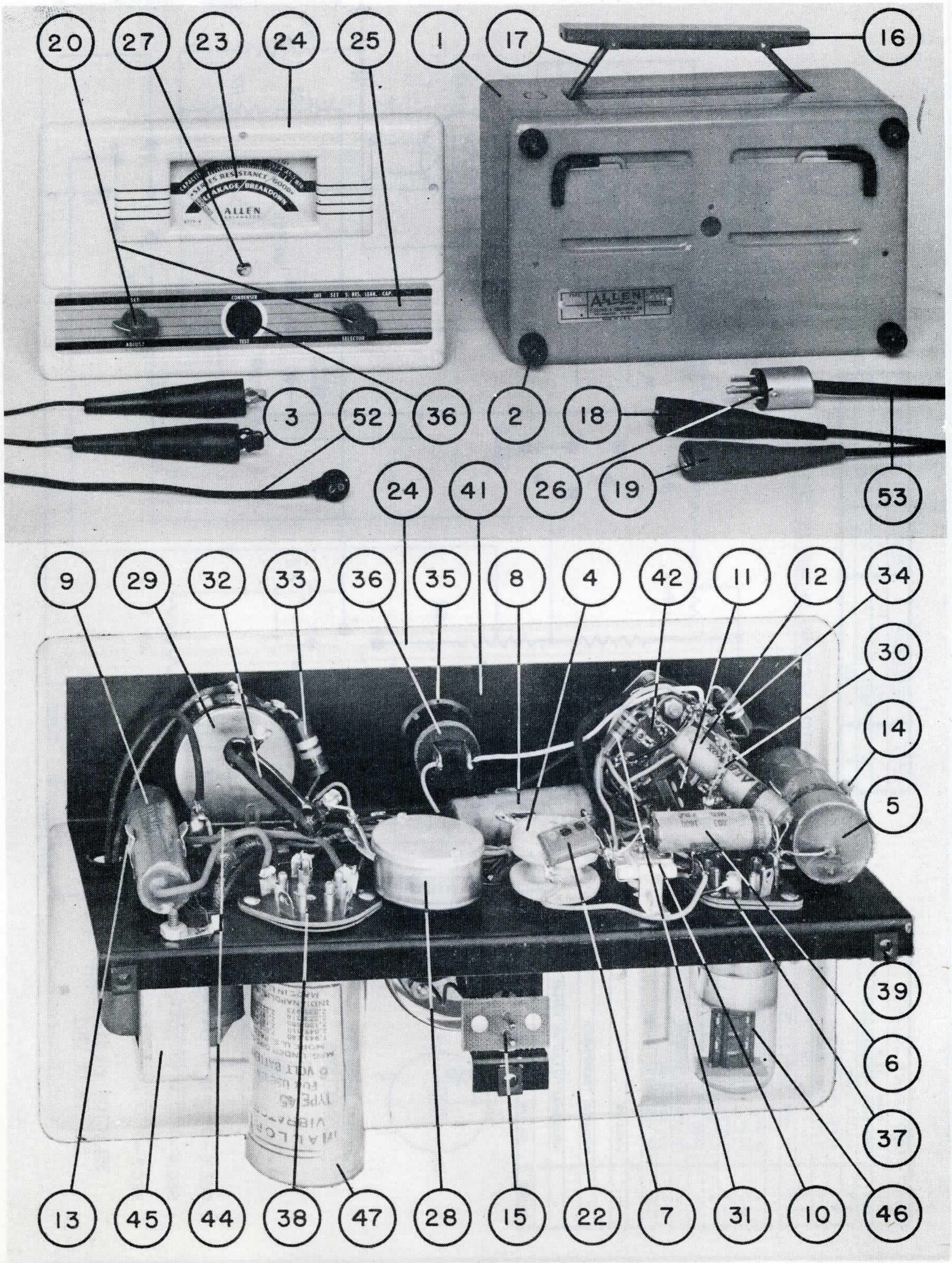
E-301 CONDENSER TESTER
PARTS LOCATION PHOTOGRAPH
FOR MODELS STAMPED SERIES "A"



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